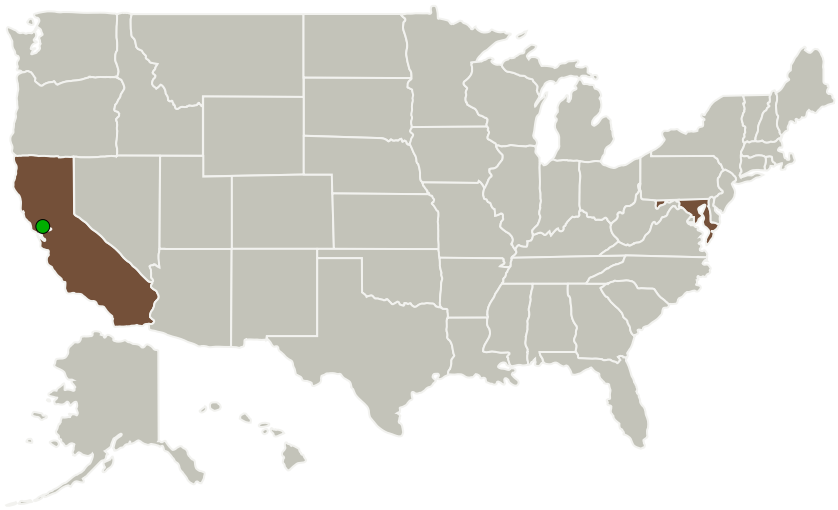
360-Degree Analysis Engine for Autonomous NAS Operations and Control, Phase I

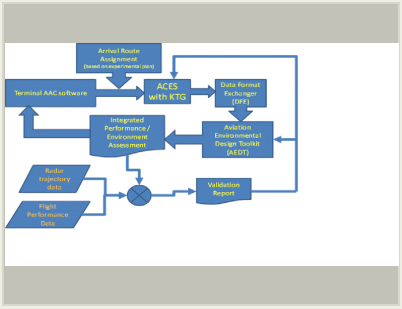
Completed Technology Project (2015 - 2015)

Project Introduction

NASA researchers have been studying ground-based conflict detection and resolution for at least ten years. Under the tool proposed herein, these researchers will be able to evaluate both the performance impact and the environmental impact. The environmental impact is important for obtaining approval to move the ground-based conflict detection and resolutions algorithms to higher Technology Readiness Levels (TRLs). Besides helping advance the AAC and tAAC algorithms, NASA researchers can experiment with autonomous operations in the NAS under a variety of different traffic loads (including UAS traffic), weather patterns, and even degrees of autonomy—from full autonomy to autonomous operations that are restricted to certain classes of airspace (such as class A). Insights gained by these experiments in the virtual world will help the community understand the benefits—and potential limits—of future autonomous operations in the NAS. Some of the research questions that can be answered by such a tool include the following. To what extent does the noise footprint of an automated separation assurance algorithm hinder its acceptance by the public? To what extent is fuel burn reduced by using automated separation assurance? How great a flight density can an automated separation assurance function allow? Under what conditions might an automated separation assurance algorithm require manual intervention?

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Intelligent Automation, Inc.	Lead Organization	Industry	Rockville, Maryland
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

June 2015: Project Start

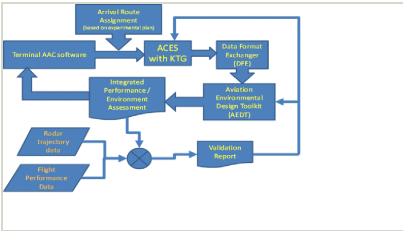
December 2015: Closed out

Closeout Summary: 360-Degree Analysis Engine for Autonomous NAS Operations and Control, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138711)*

Images



Briefing Chart Image
360-Degree Analysis Engine for Autonomous NAS Operations and Control, Phase I
(https://techport.nasa.gov/image/136691)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Intelligent Automation, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

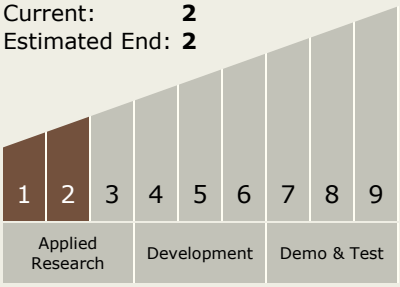
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Frederick Wieland

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System